PATENT SPECIFICATION 773,971

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COMPLETE SPECIFICATION.

Process for Moulding So-Called " Plastic " Materials.

I, JOHN FREDERICK PATRICK SMITH, a British Subject, of 17 Spenser Road, Cheltenham, in the County of Gloucester, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to the moulding of "plastics", more particularly for producing hollow articles requiring the use of a core. In general these materials call for a rigid mould and a rigid core and the problem of extracting the core after moulding greatly limits the variety of shapes that can be so moulded. In fact only the very simplest shapes of cavities permit a rigid core to be extracted. An example of an otherwise simple shape from which a rigid core cannot in general be extracted is a curved pipe.

The moulding process according to the invention essentially comprises moulding the hollow article in a thermoplastic substance, at the moulding temperature appropriate thereto, about a core of a fusible alloy whose melting point is between 80° C. and 200° C., being above said moulding temperature but below the maximum temperature to which the moulded thermoplastic article can be subjected without loss of shape, mechanical properties, surface finish or other deterioration. When the mould is broken after the moulding operation the core is removed by heating until it melts.

Many suitable fusible alloys are known having suitable melting points between 80° C. and 200° C.; and the appropriate alloy can be selected in accordance with the moulding temperature of the particular plastic to be moulded and the upper temperature limit to which the finished article can safely be subjected.

As an example acrylic resin can be satisfactorily moulded at about 65° C (149° F.). The moulded article can withstand temperatures of well over 100° C. without any ill-effect so that a commercially obtainable tin-antimony-bismuth alloy having a melting point of about 100° C. is suitable for the core of the mould, being hard enough for the purpose and capable of a good surface finish.

The application of the invention to the manufacture of a tracheotomy tube will now be described, by way of example, with reference to the accompanying drawing, in which :—

Figure 1 illustrates the tracheotomy tube in perspective and,

Figure 2 is a longitudinal part-sectional view therethrough.

Tracheotomy tubes have hitherto been made in silver, although attempts have been made to make them from vulcanite. The tracheotomy tube illustrated in the drawing is made in accordance with the invention from synthetic thermoplastic resin, specifically polymethyl methacrylate. It comprises a pipe 10 curved at 10*a* near one end and outwardly flanged at 10*b* at the other. A separate guard plate 11 is also moulded in the same plastic material and has a central aperture which enables it to be threaded on to the tube 10. Around the aperture the guard plate 11 has a short forward extension or sleeve portion 11*a* which, when the guard plate is threaded on to the pipe 10, abuts the rear surface of the flange 10*b*, as shown in Figure 2.

The pipe 10 is moulded at a temperature of about 65° C. (149° F.) utilising a core of tin-antimony-bismuth alloy having a meeting point of about 100° C., such core having a good surface finish imparted thereto before insertion into the mould. When the mould is broken the pipe, with the alloy core therein, is removed from the mould and heated to a temperature somewhat above

100° C. whereupon the core melts and is poured from the finished pipe. The guard plate 11 is then threaded on to the pipe into the position shown in Figure 2 to complete the tracheotomy tube.

It will be appreciated that the guard plate 11 need not be separate from the tube 10 but may, if desired, be moulded as an integral part of the latter.

The resulting plastic tracheotomy tube presents the advantages, over the normal silver tubes, that it is light, non-irritant to the throat or other mucous membrane and can be left in position during radiation treatment, all of which are very material benefits particularly in the case of in-dwelling tubes.

What I claim is:—

1. A process for the moulding of plastics for the production of hollow articles requiring the use of a core, which comprises moulding the hollow article in a thermoplastic substance, at the moulding temperature appropriate thereto, about a core of a fusible alloy whose melting point is between 80° C. and 200° C., being above said moulding temperature but below the maximum temperature to which the moulded thermoplastic article can be subjected without loss of shape, mechanical properties or surface finish, or other deterioration, and subsequently removing the core by heating the moulded thermoplastic article and core until the latter melts.

2. A process according to Claim 1, characterised in that the thermoplastic substance is an acrylic resin which can be satisfactorily moulded at about 65° C. to produce a moulded article which can withstand temperatures of over 100° C. and the core is a tin-antimony-bismuth alloy having a melting point of about 100° C.

3. A process for the moulding of plastics for the production of hollow articles requiring the use of a core, which comprises moulding the hollow article in an acrylic resin, at about 65° C., about a core of a fusible alloy whose melting point is about 100° C., and subsequently removing the core by heating the article and core until the latter melts.

4. A hollow moulded thermoplastic article made by the process of any of Claims 1 to 3.

5. A hollow moulded thermoplastic article, the shape of the cavity of which is such that a rigid core cannot be extracted, made by the process of any of Claims 1 to 3.

6. A curved pipe made as a thermoplastic moulding by the process of any of Claims 1 to 3.

7. A tracheotomy tube made as a thermoplastic moulding by the process of any of Claims 1 to 3.

8. A process for the moulding of thermoplastics for the production of hollow articles substantially as herein described.

9. A hollow moulded thermoplastic article substantially as herein described with reference to the accompanying drawings.

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PROVISIONAL SPECIFICATION.

Process for Moulding So-Called "Plastic" Materials.

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This invention relates to the moulding of "plastics," more particularly for producing hollow articles requiring the use of a core. In general these materials call for a rigid mould and a rigid core and the problem of extracting the core after moulding greatly limits the variety of shapes that can be so moulded. In fact only the very simplest shapes of cavities permit a rigid core to be extracted. An example of an otherwise simple shape from which a rigid core cannot in general be extracted is a curved pipe.

The moulding process according to the invention is essentially characterised by making the core of a fusible alloy whose melting point is above the moulding temperature appropriate for the plastic substance to be moulded, but is below the maximum temperature to which the moulded article can be subjected without loss of shape, mechanical properties, surface finish or deterioration of any kind. When the mould is broken after the moulding operation the core is removed by heating until it melts.

Many suitable fusible alloys are known having suitable melting points between about 80° C. and say 200° C.; and the appropriate alloy can be selected in accordance with the moulding temperature of the particular plastic to be moulded and the upper temperature limit to which the finished article can safely be subjected.

As an example methyl acrylate resin can be satisfactorily moulded at about 65° C.

(149° F.). The moulded article can withstand temperatures of well over 100° C. without any ill-effect so that a commercially obtainable tin-antimony-bismuth alloy having a melting point of about 100° C. is suitable for the core of the mould, being hard enough for the purpose and capable of a good surface finish.

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773,971 COMPLETE SPECIFICATION
1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

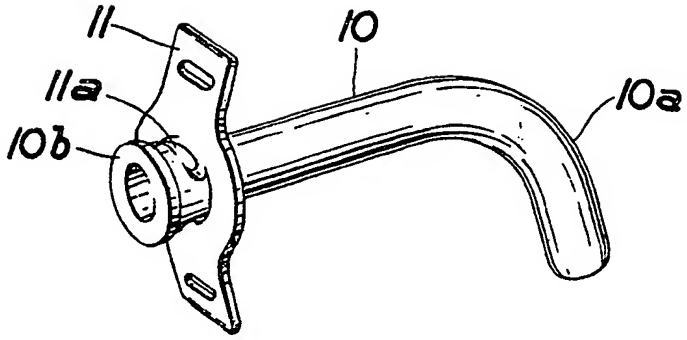

FIG. 1.

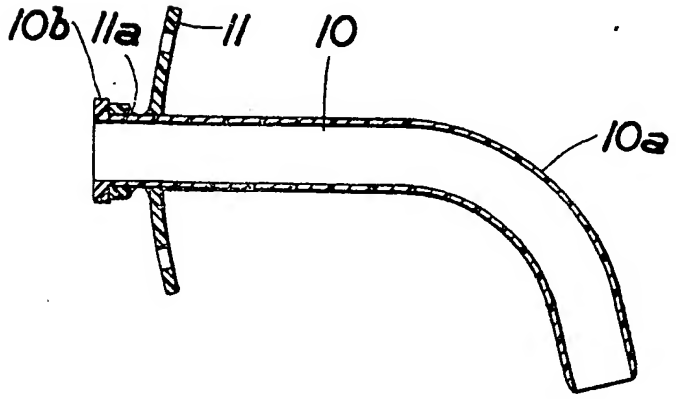

FIG. 2.